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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/781,857	02/12/2001	Turan Erdogan	12-42-7	5151

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EXAMINER

LI, SHI K

ART UNIT PAPER NUMBER

2633

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/781,857	Applicant(s) ERDOGAN ET AL.	
	Examiner Shi K. Li	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 17 August 2004 and 19 November 2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 8-18 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 8, 11-14, 17 and 18 is/are rejected.
- 7) Claim(s) 9, 10, 15 and 16 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 - 1. Certified copies of the priority documents have been received.
 - 2. Certified copies of the priority documents have been received in Application No. _____.
 - 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

DETAILED ACTION

1. In view of the Appeal Brief filed on 17 August 2004, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. (U.S. Patent 6,567,167 B1) in view of Lee (U.S. Patent 5,815,270).

Regarding claim 11, Chou et al. discloses in FIG. 1 an optical transmission system comprising a transmitter 15 for providing one or more optical input signals (col. 5, lines 16-24), an optical fiber transmission path 22 and an optical receiver 240. Said optical transmission system further comprises active polarization control arrangement 200 which includes a polarization control element 170, a polarimeter 210 and feedback control element 220. The polarization control element processes input optical signal propagating along the optical

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transmission path based on a correction signal 130 for producing as an output an optical signal exhibiting a predetermined state of polarization. Said feedback control element provides the correction signal to the polarization control element based on the control signal output from the polarimeter. The difference between Chou et al. and the claimed invention is that Chou et al. does not teach an in-line fiber polarimeter. Lee teaches in FIG. 1 an in-line fiber-optic polarimeter. Accordingly, one of ordinary skill in the art would have been motivated to employ an in-line fiber polarimeter so as to make the system more compact and rugged (col. 3, lines 19-24 and lines 51-55 of Lee). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the fiber optic transmission system of Chou et al. by incorporating an in-line fiber polarimeter because it helps to make the system more compact and rugged as suggest by Lee.

Regarding claim 8, the limitations introduced by claim 8 correspond to the limitations introduced by claim 11. The treatment of claim 11 above reads on the corresponding limitations of claim 8.

4. Claims 8, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hakki (U.S. Patent 5,659,412) in view of Lee (U.S. Patent 5,815,270).

Regarding claim 11, Hakki discloses in FIG. 5 an optical transmission system comprising a transmitter 106, a fiber transmission path 110 and optical receivers 140 and 142. FIG. 5 further comprises polarization controller 108 and 130. Hakki teaches in col. 8, line 58-60 that each of these polarization controllers may be adjusted in accordance with the present invention which is illustrated in FIG. 1 and FIG. 2. FIG. 2 comprises a polarization diversity detection circuit (equivalent to polarimeter of instant application) for generating a correction signal to control

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polarization controller 14 via path 28. The difference between Hakki and the claimed invention is that Hakki does not teach an in-line fiber polarimeter. Lee teaches in FIG. 1 an in-line fiber-optic polarimeter. Accordingly, one of ordinary skill in the art would have been motivated to employ an in-line fiber polarimeter so as to make the system more compact and rugged (col. 3, lines 19-24 and lines 51-55 of Lee). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the fiber optic transmission system of Hakki by incorporating an in-line fiber polarimeter because it helps to make the system more compact and rugged as suggest by Lee.

Regarding claim 8, the limitations introduced by claim 8 correspond to the limitations introduced by claim 11. The treatment of claim 11 above reads on the corresponding limitations of claim 8.

Regarding claim 13, Hakki teaches polarization beam splitter 132.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. and Lee as applied to claims 8 and 11 above, and further in view of Jopson et al. (U.S. Patent 6,385,356 B1).

Chou et al. and Lee disclose all limitations of claim 11 as discussed above, and further disclose an optical fiber transmission path (22 of FIG. 1 of Chou et al.) comprises the active polarization control arrangement (e.g., combination of 10 and 200 of FIG. 1 of Chou et al.) is used to orient the polarization axes (e.g., x and y optical axes) of the optical output from the in-line fiber polarimeter (col. 5, lines 39-54 and 110 and 210 of FIG. 1 of Chou et al. or via 10, 24, 38 and 40 of FIG.1 of Lee). Chou in view of Lee does not disclose at least a section of birefringent fiber and the active polarization control arrangement is used with the optical axes of

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birefringent transmission path optical fiber. Jopson discloses at least a section of birefringent fiber (1010 of FIG. 10 and col. 7, lines 54-59) and the active polarization control arrangement (1020 of FIG. 10) is used with the optical axes of the birefringent transmission path optical fiber (col. 7, lines 3-16, lines 64-67 and col. 8, lines 1-5). Accordingly, one of ordinary skill in the art would have been motivated to incorporate a section of birefringent fiber and the active polarization control arrangement is used with the optical axes of the birefringent transmission path fiber in order to impart an uniformly oriented PMD to the light beam traveling through the fibers (col. 2, lines 18-29). Therefore, it would have been obvious to one of artisan skilled in the pertinent art at the time the invention was made to have modified the fiber optic transmission system of Chou et al. and Lee by incorporating a section of the birefringent fiber for orienting the optical axes of the birefringent transmission path fiber because Jopson suggests that this allows PMD uniformity to the light beam traveling through the fibers.

6. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. and Lee as applied to claims 8 and 11 above, and further in view of Liu et al. (U.S. Patent 6,208,442 B1).

Chou et al. and Lee have been discussed above in regard to claims 8 and 11. The difference between Chou et al. and Lee and the claimed invention is that Chou et al. and Lee do not teach a polarization beam splitter at the output of the in-line polarization. Liu et al. discloses in FIG. 7 polarization beam splitter 724 and wavelength filters 742 disposed at each output of the polarization beam splitter (PBS) 724 to discriminate between two orthogonal channels with closely spaced wavelengths. Accordingly, one of ordinary skill in the art would have been motivated to incorporate polarization beam splitter and wavelength filters in order to

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demultiplexing wavelength channels and provide different polarization to contiguous channels (col. 2, lines 24-30). Therefore, it would have been obvious to one of ordinary skill in the art to have modified the fiber optic transmission system of Chou et al. and Lee by placing PBS and wavelength filters disposed at each output of the PBS because Liu et al. suggests that this demultiplexes wavelength channels and allows a plurality of channels to have a first and second polarization.

7. Claims 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hakki and Lee as applied to claims 8, 11 and 13 above, and further in view of Liu et al. (U.S. Patent 6,208,442 B1).

Regarding claim 14, Hakki and Lee have been discussed above in regard to claims 8, 11 and 13. The difference between Hakki and Lee and the claimed invention is that Hakki and Lee do not teach a wavelength filters disposed at each output of polarization beam splitter. Liu et al. discloses in FIG. 7 polarization beam splitter 724 and wavelength filters 742 disposed at each output of the polarization beam splitter (PBS) 724 to discriminate between two orthogonal channels with closely spaced wavelengths. Accordingly, one of ordinary skill in the art would have been motivated to incorporate polarization beam splitter and wavelength filters in order to demultiplexing wavelength channels and provide different polarization to contiguous channels (col. 2, lines 24-30). Therefore, it would have been obvious to one of ordinary skill in the art to have modified the fiber optic transmission system of Hakki and Lee by placing PBS and wavelength filters disposed at each output of the PBS because Liu et al. suggests that this demultiplexes wavelength channels and allows a plurality of channels to have a first and second polarization.

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Regarding claim 17, Hakki teaches first polarization controller 108 disposed at an optical transmitter and a second polarization controller 130 disposed at an optical receiver.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. and Lee as applied to claims 8 and 11 above, and further in view of Hass et al. (U.S. Patent 5,311,346).

Chou et al. and Lee have been discussed above in regard to claims 8 and 11. The difference between Chou et al. and Lee and the claimed invention is that Chou et al. and Lee do not teach to locate the polarization controller at the transmitter site. Hass et al. discloses in FIG. 1 a polarization control method where the polarization controller locates at the transmitter site. One of ordinary skill in the art would have been motivated to combine the teaching of Hass et al. with the modified optical transmission system of Chou et al. and Lee because it is desirable to make the receiver simple, for example, in subscriber networks where receivers are located in customer locations. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to locate the polarization controller at the transmitter site, as taught by Hass, in the modified optical transmission system of Chou et al. and Lee because it is desirable to make the receiver simple.

Allowable Subject Matter

9. Claims 9-10 and 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

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10. Applicant's arguments with respect to claims 8 and 11 have been considered but they are not persuasive.

In page 4 of the Brief, the Appellant argues that Chou et al. introduces a predetermined delay with respect to phase (that is, a time delay is introduced between the two principal states of polarizations). The polarization states themselves remain intact. The Examiner disagrees. The output optical signal of polarization control element 170 of Chou et al. exhibits "a predetermined state of polarization" as recited by claims 8 and 11, and said predetermined state of polarization is a result of the feedback control provided by control circuit 220. The Examiner's explanation follows.

First, a summary of polarization is helpful. Section 8.1 of Hecht ("Optics" Third Edition by Hecht, Addison Wesley Longman, 1998, pp.319-325) is attached as reference. Polarization refers to the time-varying behavior of the electric field strength vector of an electromagnetic wave. If the vector is projected onto two orthogonal axes, which are perpendicular to the direction of propagation, we have the E_x and E_y components. Chou et al. refers these as principal state of polarizations (PSPs). When the PSPs are in phase, it is called linear polarization. When the PSPs have equal amplitudes and a phase difference of $\pi/2$, it is called circular polarization. In general, the electric field strength vector traces the shape of an ellipse and it is called elliptical polarization. (See Hecht Sections 8.1.1, 8.1.2 and 8.1.3, respectively, for linear, circular and elliptical polarizations.) Hecht shows several polarization configurations in FIG. 8.7(a) as examples. The term state of polarization (SOP) refers to these various polarization configurations.

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With the foregoing background, the Examiner immediately recognizes FIG. 3 of Chou et al. as a device for changing an elliptical polarization to a linear polarization by delaying one PSP with respect to the other. Chou et al. clearly explains this in col. 1, lines 43-45 as "the output SOP is represented by a linear combination of the PSPs which are time delayed with respect to each other". Therefore, Chou et al. teaches a predetermined state of polarization (linear polarization or \mathcal{P} -state, see Hecht p. 323, right col., last paragraph) as the output of polarization control element 170. To obtain a linear polarization, an adjustable delay is introduced by moving delay assembly 174 up or down under the control of correction signal 130. Therefore, Chou et al. read on the claim limitation and the rejection of claims 8, 11, 13 and 18 under 35 U.S.C. 103(a) as being unpatentable over Chou et al. in view of Lee is proper.

11. Applicant's arguments with respect to claims 13-14 and 17-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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